

Key Concepts from the April 18th WG 3 Meeting
on Residential and Small Commercial Demand Response Topics

I. Summary of ADRS Load impact presentation- Kitty Wang and Joel Swisher

A. Load impact Results from ADRS systems installed in 2004

1. Peak load reductions for homes equipped with ADRS systems were roughly twice as high as the peak reductions for homes with the CPP rate only.
2. Average peak reductions for high usage homes ranged from 2.37 Kw for SCE to 1.2kW for SDG&E. Probably due to higher saturation of pools, bigger homes, in SCE area and weather
3. Average kW reductions for 2005 homes are estimated at 1.42kW/ household (see slide 9)

B. Program Design Recommendations

1. Future controls programs should target high user customers with pool pumps who are usually not home during the afternoon.
2. Load impact results suggest utilities should consider changes to the definition of peak period, perhaps 3 PM-7PM for residential or 2 PM to 5:30 PM depending on the sector.
3. Data is available to perform back of the envelope estimate of what are the expected benefits of ADRS type systems for average household and then compare these to cost of installing future automated demand control systems. Envensys, the firm that installed, these systems has gone bankrupt. (MM thinks this analysis should be done)

II. Summary of ADRS Market Research- Craig Boyce

- A. There may be a conflict between utility system controller desires to send CPP signals on an unpredictable basis (e.g. whenever an emergency strikes) vs customer feedback that they want signals sent on a predictable and plausible basis, e.g. only when its hot, over 90 degrees or there is tangible evidence an emergency has taken place. Also a conflict when utility revenue requirement types want to send a CPP signal a minimum number of times per summer, whether we need it or not. These customers objected to sending high price signals when its 74 degrees out and clearly not an emergency. These conflicts need to be worked out in rate design/ implementation of CPP going forward.
- B. Customers on the ADRS pilot expected more and better controls once they have been exposed to the current technology. They want more feedback on how they are doing on peak days but it is unclear whether how much more, if any, customers are willing to pay more for this. Customers feel they have already paid for this system by investing their time in learning how to reduce peak load.

- C. Three types of customer response were discovered in the interview process. Spectators (set it and forget it, ½ of participants, Team mates (want to partner with utility to manage their energy use and get feedback to fine tune strategies, 1/6 of participants) and Converts (see CPP as a call for customers willing to sacrifice comfort in order to do the right thing for the environment, willing to answer call as long as the “ emergencies” or high prices are real.)
- D. Next steps: If utilities want to promote automated control systems for residences they should begin product development and a market test as part of an alliance with manufacturers or single one. Estimates 1 year of work to get this product development / program design completed.

III. Summary of Commercial Load Impact from CPP rates analysis- Steve George

- A. Observed peak load impacts from 2004 and 2005 summers roughly comparable, even though prices changed.
- B. Several elasticities of substitution estimated depending on sample selection criteria. Result for customers present in both summers and EOS of -.04
- C. Average peak kwh reduction on peak event days ranged from 5.9% (GT20kW customers to 6.7% (less than 20kW customers)
- D. Final report due in 3rd week in May

IV. Summary of Hourly Load Impact results for Residential customers on pilot

- A. Hourly impact analysis confirmed that average peak savings was 13.1 % statewide from CPP rates plus or minus 1 % at 95% confidence. Time period= 2PM to 7PM on CPP days.
- B. Average peak load reductions ranged from 18% in climate zone 4 to 10% in climate zone 1 (coastal) at 5PM. Maximum reductions usually found at 5Pm in all climate zones.
- C. Hourly model allows one to test the impact of different CPP price levels on peak load savings. CRA tested CPP prices of 30 cents and 90 cents/ kwh vs the 58 cents/ kwh average peak impact. Results showed a 37.5% in additional peak savings for the 90 cent rate and a 20% loss in savings for the low rate, 30 cents/kwh.
- D. Paper will be posted during May after receipt of comments.

V. Summary of Presentation on Direct Energy Feedback Devices from Lynn Fryer Stein

- A. Overall energy savings from direct feedback devices vary from 3-15%.
- B. Hydro One pilot found energy savings of 6.5% for homes with direct energy feedback devices, 500 homes followed for 2½ years, Customers on flat rates
- C. Feedback most useful when accompanied by savings goal
- D. Feedback most effective when delivered quickly
- E. Three types of non communicating displays on market now:
 - i. CTs at electrical panel,
 - ii. Meter collar that requires utility installation and

- iii. Optical sensors which are a Retrofit to electromechanical meter
- F. A number of communicating displays now on market but initial cost is still high
 - i. Manufacturers include: Cent-a-Meter, The Energy Detective, EUM-2000, San Vision
- G. Also a number of displays integrated with prepayment systems are on market
- H. A number of great calm display technologies were also highlighted in this presentation from power aware cords that glow to flower lamps that bloom as power demand increase
- VI. Summary of 2005 Shadow bill analysis presented by Mark Martinez
 - A. Residential average dollar savings over 28,000 bills over 13 month period was 5.5% or \$85/year for customers who participated on CPP rates vs current rates or otherwise applicable tariff.
 - B. Small commercial average dollar savings over 13 month period for CPP customers was 10% or \$2,200 dollars per year for customers 20kW to 200 kW
 - C. Over 85% of residential customers had lower bills and 80% had lower bills for small commercial <200 kW by participating on CPP rates. .
- VII. Summary of Impacts of Web Feedback on Customer Response to CPP signals- Nexus corporation
 - A. **Customers were given monthly Bill analysis via email or regular mail . Each customer received customized analysis with measure recommendations based in their home energy survey data and monthly bill data. Other Features included”**
 - i. **Automated transfer of bill data**
 - ii. **Analysis of monthly by critical-peak and on-peak energy consumption**
 - iii. **Breakdown of consumption by end use**
 - iv. **Personalized recommendations with extensive additional resources to seek if they want to install measure.**
 - v. Results suggested only a small incremental (above CPP rate effect) average peak savings. At the same time there was strong customer interest in continuing to receive monthly newsletter. **Active and sustained use was observed for most participants –**
 - a) **77% visited the website at some point during the program.**
 - b) **29% of participants visited the website within the first 6 days of operation)**
 - c) **5 to 26 new unique users (3 to 17% of participants) every calendar month of program operation**
 - d) **For comparable utility sites offering bill information, about 1-3% of a target population typically visits a website on their own when informed of its benefits. In this test there were 77% , a big break through.**